



Dart Hawkesbury
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D206-667-247TRN
Job Sheet 167823-G



Part No: D206-667-247TRN

Job Qty: 1 ea

Part Name: Crosstube Assembly, Mid Aft



Part Weight: 0 lbs

Status: Scheduled

Priority: High

Job Created: 11/7/17

Job Tracking No:

Due Date: 11/10/17

Created By: Victoria Michaud-Febrille

Type: Stock

Description:

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea		11/9/17	0.00	0.00	Start Up Crosstubes		
100	Mori Seiki	1 pcs		11/9/17	3.85	1.33	Mori Seiki TL-40		
110	QC	1 pcs		11/9/17	0.00	0.00	QC2		
120	Mori Seiki	1 pcs		11/9/17	0.00	1.33	Mori Seiki TL-40		
130	QC	1 pcs		11/9/17	0.00	0.00	QC2		
140	QC	1 pcs		11/9/17	0.00	0.00	QC8		
145	Crosstubes	1 pcs		11/9/17	0.00	0.37	Crosstube		
150	HandFXtube	1 pcs		11/10/17	0.00	0.32	Crosstube		
160	QC	1 pcs		11/10/17	0.00	0.00	QC7		
170	Packaging	1 pcs		11/10/17	0.00	0.00	Packaging3		
180	QC21-SA	1 Ea		11/10/17	0.00	0.00	QC21		

Part Op 100 - 1-Fill tube with sand & install plugs 206-207 on both ends as per Folio FB030 2-Turn first side as per Folio FB030
Descriptions: 3-Blend transition line with belt sander 60 grit.

120 - 1-Turn second side as per Folio FB030 2-File down transition lines smooth.

145 - GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.

150 - 1- handfinish X-TUBE INSIDE AND OUT

170 - LOCATION : LG014

Job Allocations

Operation	Component Part	Required	Inventory	Allocated	Std Qty
90-Start up Operation	D6004-115	1	47	0	0

Bulk

Part Specifications

Specifications could not be found.

Plex 11/7/17 9:12 AM dart.Michaud-Febrille.Victoria

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____		DISPOSITION		AGAINST DEPARTMENT/PROCESS					
Part No. _____		Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		Skid-t Machir Thermoform Large					
NCR No. _____									
Date : _____		Step #: _____		QTY E _____					
Description Work Order Deviation									
Root Cause <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"> Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ </td> <td style="width: 50%;"> No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐ </td> </tr> </table> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"> Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ </td> <td style="width: 50%;"> Temperature/ Set-up ☐ BOM/Route ☐ Broken/Dama ☐ Inspection Inc ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Ir ☐ Drill Holes ☐ </td> </tr> </table> OTHER : ☐						Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/ Set-up ☐ BOM/Route ☐ Broken/Dama ☐ Inspection Inc ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Ir ☐ Drill Holes ☐
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐								
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Change No:
Operation:
Revision:
PART NO:
D206 - 667 - 247TRN
Start up Operation

Crosstube Assembly, Mid Aft

S011821

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 Email: sales@dartaero.com
 www.dartaerospace.com

ring ☐
 ility ☐
 her ☐
 Approval ☐
 ed By ☐
 Supervisor ☐
 rification ☐
 ordinator ☐
 ival ☐
 Wrong ☐
 mensions ☐
 er tolerance ☐
 rect ☐
 Missing ☐
 id ☐

Misaligned/off center ☐

Turning Sequence ☐

Mfg Date: 11/20/17
 Job No: 167823-G

DART AEROSPACE LTD	Work Order:	
Description: Crosstube Assembly, Mid Aft	Part Number:	D206-667-247
Inspection Dwg: D206-667-247 Rev: A		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.490	+0.005/-0.000	2.4925 ✓		VERN 08	
	2.025	+0.005/-0.000	2.0285 ✓			
	2.079	+0.005/-0.000	2.084 ✓			
	2.145	+0.005/-0.000	2.150 ✓			
	2.209	+0.005/-0.000	2.214 ✓			
	2.287	+0.005/-0.000	2.291 ✓			
	2.363	+0.005/-0.000	2.3665 ✓			
	0.200	+/-0.010	.200 ✓		VERN 08	
	R0.063	+/-0.010	.063 ✓		RG	
	R2.00	+/-0.010	2.0 ✓		RG	
	R0.063	+/-0.010	.063 ✓		RG	
	4.438	+/-0.010	4.440 ✓		VERN 08	
SIDE B	2.490	+0.005/-0.000	2.4935 ✓		VERN 08	
	2.025	+0.005/-0.000	2.0285 ✓			
	2.079	+0.005/-0.000	2.084 ✓			
	2.145	+0.005/-0.000	2.150 ✓			
	2.209	+0.005/-0.000	2.214 ✓			
	2.287	+0.005/-0.000	2.291 ✓			
	2.363	+0.005/-0.000	2.367 ✓			
	0.200	+/-0.010	.199 ✓		VERN 08	
	R0.063	+/-0.010	.063 ✓		RG	
	R2.00	+/-0.010	2.0 ✓		RG	
	R0.063	+/-0.010	.063 ✓		RG	
	4.438	+/-0.010	4.439 ✓		VERN 08	
	99.76	+/-0.020	99.75		TAPE	

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

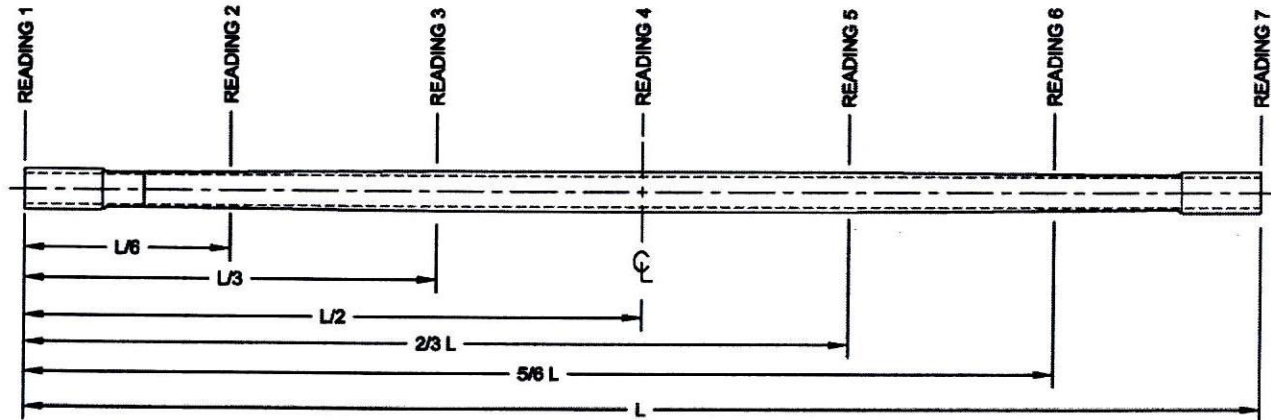
QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QS1042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabelled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : _____					

DART AEROSPACE LTD	Work Order:	
Description: Crosstube Assembly, Mid Aft	Part Number:	D206-667-247
Inspection Dwg: D206-667-247 Rev: A		Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	369	365	355	356	.014	0.045"
READING 2 L= 16.63	202	207	205	206	.005	
READING 3 L= 33.25	343	348	343	340	.008	
READING 4 L= 49.88	364	364	358	359	.006	
READING 5 L= 66.506	345	344	343	344	.002	
READING 6 L= 83.133	202	206	205	206	.004	
READING 7 L= 99.76	363	361	353	357	.010	

Calibration Result

Actual Block Thickness: 200-400

SITESCAN 250 Measured Thickness: 200-400

Measured by:	<i>PMP</i>	Audited by:		Preliminary Approval:	
Date:	2012-11-17	Date:		Date:	

Rev	Date	Change	Revised by	Approved
A	11.06.21	New Issue	KJ	
B	12.02.02	Dimension 4.438 was 4.500	KJ	
C	12.06.01	Wall thickness form added	KJ	

Item	Qty -247	Part Number	Description
1	X	D206-667-247	CROSSTUBE ASSEMBLY (206L MID AFT)
2	1	D6004-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2892-1	SUPPORT
6	4	D3595-063-450	RUBBER CUSHION
7	4	MS21920-22	CLAMP
8	14	MS20601AD4W10	RIVET (OR NAS9302B-4-10)
9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299- 947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6004-115
FINISHED LENGTH = 99.76±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D206-667-247" AND BATCH NUMBER ON
INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS).
- 7) WEIGHT: 21.1 lbs (-607 = 17.7 lbs)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY,
TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 10 PASSES. MAXIMUM TUBE FLATTENING DUE
TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2892-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI
015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-22 CLAMPS WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE
D2892-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE
LOCATED ON CROSSTUBE SUPPORTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN
SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

DEO ATTACHED

OCW #11-615

11.07.28

UNDER REVIEW

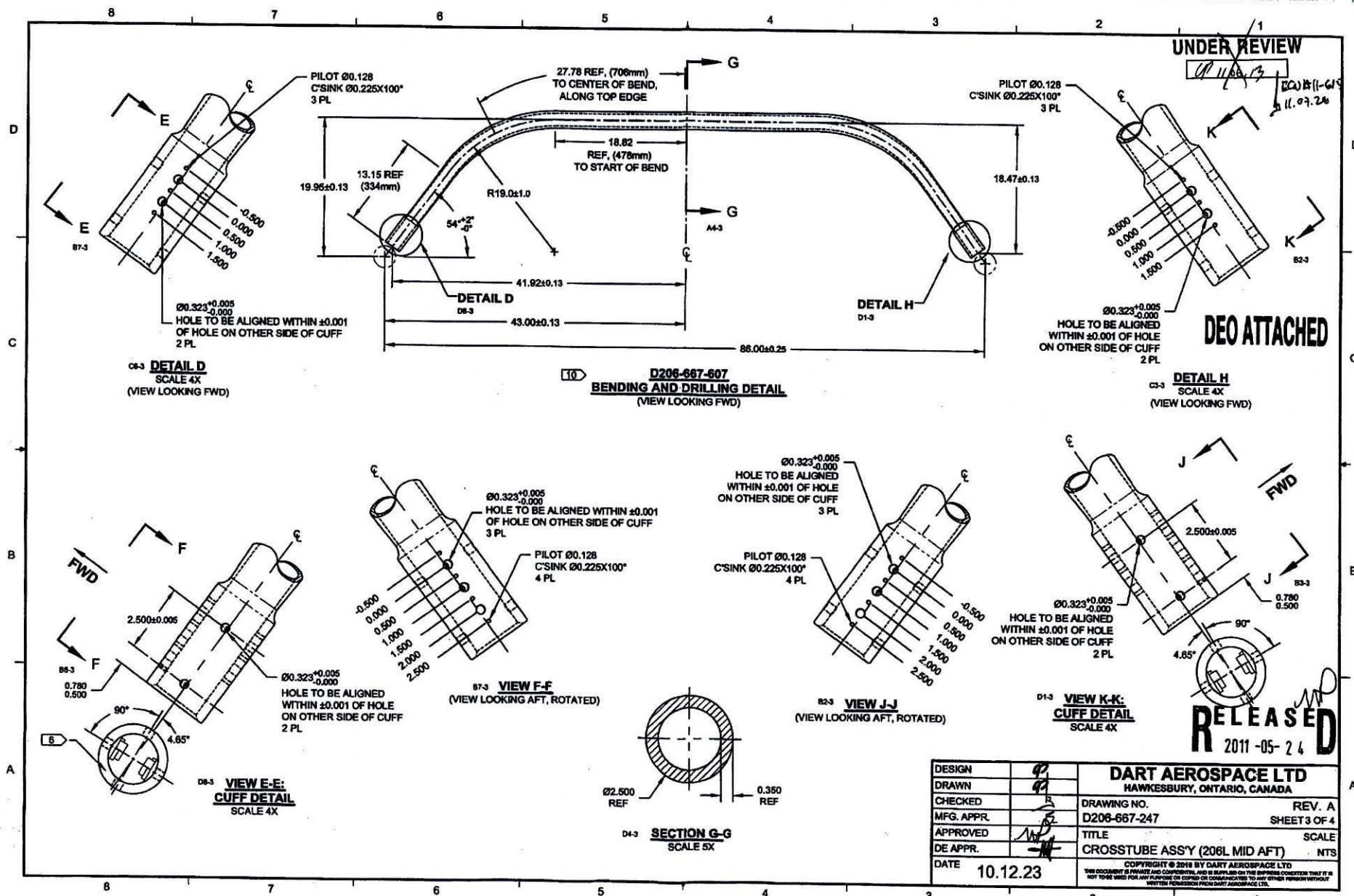
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RELEASED
2011-05-24

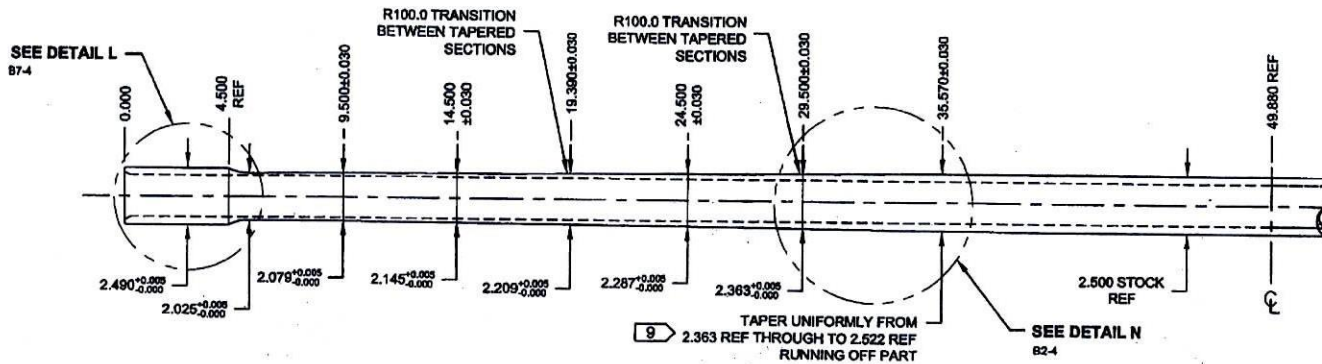
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REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	10.12.23		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D206-667-247	REV. A SHEET 1 OF 4
TITLE CROSSTUBE ASSY (206L MID AFT)	SCALE NTS

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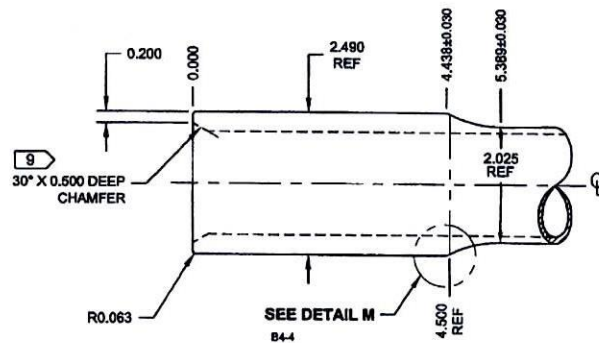
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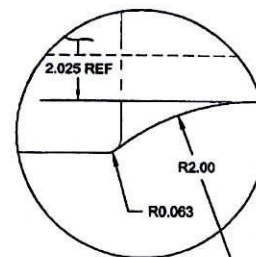
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11.07.28

UNDER REVIEW

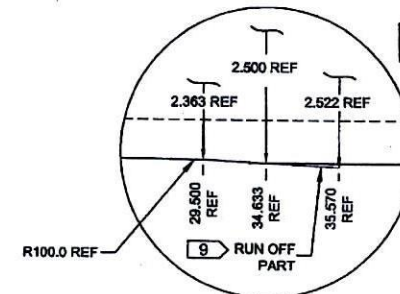
DEO ATTACHED



C7-4 DETAIL L: CROSSTUBE CUFF
SCALE 2.5X



B6-4 DETAIL M:
CUFF TRANSITION
NOT TO SCALE



C4-4 DETAIL N:
TAPER RUN-OFF
NOT TO SCALE

RELEASED
2011-05-25

DESIGN	9	DART AEROSPACE LTD	
DRAWN	9	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9	DRAWING NO.	REV. A
MFG. APPR.	9	D206-667-247	SHEET 4 OF 4
APPROVED	9	TITLE	SCALE
DE APPR.	9	CROSSTUBE ASS'Y (206L MID AFT)	NTS
DATE	10.12.23	COPYRIGHT © 2010 BY DART AEROSPACE LTD	
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8 7 6 5 4 3 2 1

DRAWING NO. D206-667-247	TITLE CROSSTUBE ASS'Y (206L MID AFT)	REV. A	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D206-667-247-A-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN 90	CHECKED ASS	MFG. APPR. AB	APPROVED JMP		DE APPR. #		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11/07/21		DATE 11.07.21		

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -247	Part Number	Description
9	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

9	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
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NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2892-1 SUPPORT: ABRABE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

WAS:

- 12) INSTALL D2892-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-28
WJ